The New York Collaborative has been working to define the ordering processes that will support migration from a UNE-P arrangement or a line sharing arrangement to a line splitting arrangement in as automated a manner as possible. Under the supervision of the New York Commission, the Collaborative has agreed on an implementation schedule for these line splitting-specific OSS capabilities. Under this schedule, Verizon began conducting a pilot in New York in June 2001 using new OSS functionality to add data to UNE platforms in a line splitting arrangement while re-using the same network elements, including the loop, if it is DSL-capable. Verizon is targeting October 2001 the new OSS capability for Virginia that will support transitions from line sharing to line splitting arrangements consistent with the business processes and timelines defined in the New York Collaborative.

V. ISSUES RELATING TO DSL SERVICE OVER COPPER NETWORK

(Issue III-10)

A. LOOP QUALIFICATION

Q. CAN YOU COMMENT ON AT&T's LOOP QUALIFICATION DATA PROPOSAL?

A. AT&T vaguely implies that Verizon VA does not provide adequate loop qualification data, and seeks at its option to use any loop pre-qualification methods conceivably available to Verizon VA.[6] AT&T seeks access to loop qualification information to the same extent as Verizon VA, its affiliates, or any

[6] *AT&T Petition* at 164 and AT&T interconnection agreement Schedule 11.2.17 § 1.3.1.

other unaffiliated carrier, regardless of how that information resides in Verizon VA's network.[7]

Q. DOES VERIZON VA PROVIDE CLECS WITH ADEQUATE LOOP QUALIFICATION DATA FOR PROVIDING xDSL SERVICE?

A. Yes. The Commission has twice found that Verizon VA's proposed language provides "nondiscriminatory access to OSS pre-ordering functions associated with determining whether a loop is capable of supporting xDSL technologies."[8]

Q. PLEASE EXPLAIN VERIZON VA'S PROPOSAL FOR PROVIDING CLECS WITH LOOP QUALIFICATION DATA.

A. As in New York and Massachusetts, Verizon VA's proposed contract language permits a CLEC to access loop qualification information in one of three ways.[9]

First, Verizon provides access to a mechanized loop qualification database in compliance with Commission requirements to meet CLEC needs in providing xDSL loops.[10] This database provides information relevant to whether a particular loop is qualified to provide the xDSL service the CLEC wants to provide. This is the same database that is used by Verizon Advanced Data Inc. (VADI). AT&T may utilize this mechanized loop qualification database, where available, prior to submitting an electronic order for line sharing.

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7 AT&T interconnection agreement § 11.2.2.5.

8 *NY Verizon § 271 Order* ¶ 140; *see also MA Verizon § 271 Order* ¶ 60.

9 *See* Verizon-proposed interconnection agreement to AT&T § 11.2.12.2; Verizon-proposed agreement to WorldCom § 3.14 of UNE Attachment. This is the same language approved in the *MA Verizon* § 271 Order at ¶¶ 55-60.

Second, if AT&T chooses not to use the mechanized loop qualification database, Verizon VA will make loop qualification information available through either a manual loop qualification, or by a third means, an Engineering Query.[11] These processes may involve MLT testing, access to electronically-stored loop make-up information, and a review of paper records ("cable plats"). Verizon VA can access paper plant location records from various engineering offices throughout the region, obtain the requested information, and present it back to AT&T within the time specified by the *UNE Remand Order*. Again, this same process applies to VADI.

Q. ARE THERE ADDITIONAL METHODS FOR AT&T TO ACCESS LOOP QUALIFICATION DATA BEYOND THE INTERCONNECTION AGREEMENT?

A. Yes. In addition to the three methods of access offered by Verizon VA's proposed interconnection agreement, Verizon VA has made a bulk loop qualification method available to CLECs who request information in a bulk format. This information is available by central office and is available in an electronic format. AT&T may obtain this bulk information by entering into a separate licensing agreement with Verizon VA.

Q. DOES VERIZON VA PLAN TO MAKE ANY OTHER METHOD OF ACCESS TO LOOP QUALIFICATION DATA AVAILABLE TO AT&T IN THE FUTURE?

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[10] *See MA Verizon* § 271 Order.

A. Yes. In the New York Collaborative, some CLECs have expressed interest in obtaining electronic access to the limited loop make-up information contained in a back office inventory system known as Loop Facilities Assignment Control System (LFACS). LFACS is primarily a loop inventory and assignment system for voice grade service that contains limited loop make-up information. As Verizon has explained to the CLECs in the New York Collaborative, the percentage of terminals for which LFACS contains at least one loop make-up (not the percentage of loops for which LFACS contains loop make-up information, nor the percentage of terminals that contain a complete loop make-up from the central office to the customer address) is limited. At the terminal level, the loop make-up represents the make-up of a single loop and does not necessarily represent the characteristics of any other loops in that terminal. Further, loop make-ups can change during the normal course of engineering the network.

Verizon voluntarily offered in ongoing collaborative proceedings in New York to provide CLECs with electronic access to the loop make-up information in this system, provided that the CLECs agree on an approach and reimburse Verizon for development costs. While none of the CLECs indicated that they wanted Verizon to proceed on these terms, in an effort to accommodate these carrier-customers, Verizon has moved ahead to develop and deploy a pre-order process to provide CLECs with electronic access to the limited loop make-up information that is currently stored in LFACs. An interim process is currently in place whereby a

[11] *See* Verizon-proposed interconnection agreement to AT&T § 11.2.12.2; Verizon-proposed agreement to WorldCom § 3.14 of UNE Attachment.

CLEC can submit an electronic request for loop make-up information and will receive an electronic response within 24 hours. The response will either contain the loop make-up information as it appears in LFACS or will indicate that the requested information does not exist. A new electronic pre-order transaction that will provide this information on a real-time basis was presented by Verizon to the CLEC Change Management forum in January 2001 and is scheduled for implementation in October 2001.

Once this long term solution has been implemented, and costs and prices developed, Verizon VA will amend its interconnection agreements with AT&T to include access to LFACs data. Until the long term process can be fully developed, however, it is premature to negotiate the specific contract language at this time.

Q. SHOULD AT&T BE PERMITTED TO DECIDE AT ITS SOLE DISCRETION WHETHER IT WILL USE VERIZON VA'S PRE-QUALIFICATION PROCESS TO INDIVIDUALLY QUALIFY LOOPS TO PROVIDE ADVANCED SERVICES?

A. No. If Verizon VA's pre-qualification tools are utilized, and pre-qualification information has been returned from Verizon VA to AT&T, then AT&T has the means and information required to decide whether or not to provide advanced services to its customers. AT&T should not be permitted to use its pre-qualification tools instead of those developed by Verizon VA to make this determination. The existing loop qualification methods and tools developed have

been implemented on the basis of the consensus of all parties and collectively meet the CLECs' needs for pre-qualifying loops for DSL. Moreover, a number of the processes and programs developed have been as a result of direct CLEC intervention and request. Verizon VA accordingly has invested significant amounts of time and money into modifying its systems and building new capabilities. It should not now be required to expend more resources to accommodate just one CLEC in an idiosyncratic manner that is not required under applicable law. Consistent utilization of the database by all CLECs ensures that Verizon delivers the specific xDSL loop that each CLEC requests.

Q. PLEASE COMMENT ON AT&T'S PROPOSAL REGARDING QUALIFICATION OF LOOPS PREVIOUSLY USED TO PROVIDE ADVANCED SERVICES.

A. AT&T requests that if a loop has previously been used by another carrier to provide service in the high frequency spectrum (HFS), then Verizon VA should be responsible if the loop fails to meet the operating parameters of the loop.[12] However, AT&T proposes inconsistent contract language on this point. In its proposed Schedule 11.2.17, § 1.3.3, AT&T states:

> Verizon shall be responsible for assuring the loop can support service in the HFS regardless of whether or not AT&T performs a pre-qualification of the Loop. When AT&T opts not to perform Loop pre-qualification on a Loop employed in Line Splitting and the Loop was not previously pre-qualified and/or conditioned, AT&T will not hold Verizon responsible for service performance in the HFS unless and until the Loop is qualified according to then-current Verizon Loops qualification procedures.

[12] *AT&T Petition* at 177.

Should AT&T opt not to pre-qualify a loop, and that loop fails to support service in the HFS, Verizon VA will be held responsible under the first sentence, but will not necessarily be responsible under the conditions stated in the second sentence. Thus, the absolute nature of the allocation of responsibility in the first sentence is not consistent with the conditional nature of responsibility in the second sentence.

Q. ONCE A LOOP IS USED TO PROVIDE ADVANCED SERVICES, IS IT AUTOMATICALLY QUALIFIED TO PROVIDE ANY ADVANCED SERVICE AT ANY TIME?

A. No. Verizon VA would agree that a loop that has been pre-qualified for one advanced data service will be pre-qualified for the *same* advanced data service in the same time period (*i.e.* the loop has been in continuous use for the same service). However, pre-qualification for one type of advanced data service does not automatically pre-qualify that loop for another type of advanced data service. Nor does it guarantee that the same loop will still be qualified sometime later if the original service has been discontinued, for the network might have been upgraded or changed in the interim. Verizon has received trouble reports from DLECs even when an xDSL capable loop is pre-qualified on a loop that has previously been used by another DLEC for the provisioning of xDSL. Because not all carriers use the same technology, a loop that can provide data service for one carrier may not be able to provide service for another. By eliminating the pre-qualification process for loops already providing advanced services, Verizon VA will receive unnecessary trouble reports, causing it to operate in an inefficient

manner. This will direct resources from customers who really need assistance, and will unfairly expose Verizon VA to financial penalties due to delays in repairing real problems. In addition, eliminating the pre-qualification process would require OSS modifications since Verizon VA's systems are currently designed to require a pre-qualification on advanced services such as Line Sharing and Line Splitting.

B. LINE SHARING PROVISIONING INTERVALS

Q. WHAT PROVISIONING INTERVALS WILL APPLY TO LINE SHARING?

A. On March 29, 2001, Verizon notified all CLECs that effective May 1st Verizon will shorten its standard interval for provisioning line sharing orders on five or fewer arrangements to three business days in all Verizon-East jurisdictions for loops that do not require conditioning or facility modifications. Thus, Verizon VA has amended its proposed interconnection agreement to AT&T to reflect this interval.[13]

Verizon VA and AT&T are still negotiating the intervals for collocation augments necessary to permit line sharing, and may be able to reach an agreement. Verizon VA reserves the right to supplement this testimony in the event the Parties cannot reach agreement.

[13] Verizon-proposed interconnection agreement to AT&T § 11.2.17.2 (vi); Verizon-proposed interconnection agreement to WorldCom § 4.4.6 of UNE Attachment.

C. SPLITTER PLACEMENT

Q. PLEASE COMMENT ON AT&T'S SPLITTER PLACEMENT PROPOSALS.

A. AT&T proposes to require Verizon VA to place splitters in shared common areas or to permit AT&T to place splitters "in any type of collocation."[14] However, requiring an ILEC to place splitters in any particular place has been rejected as a matter of law. In *GTE Services Corp.*,[15] the United States Court of Appeals for the District of Columbia overturned Commission rules that would have given CLECs the right to designate where equipment can be collocated in an ILEC's central office. In vacating the Commission's rules, the Court held that the ILEC, not the CLEC, has the right to determine where equipment is collocated in the ILEC's facilities. Thus, AT&T is not entitled to dictate that location in Verizon VA's central office, and its proposed language must therefore be rejected.

D. SPLITTER OWNERSHIP

Q. DOES VERIZON VA OFFER A VERIZON-OWNED SPLITTER OPTION FOR LINE SHARING OR LINE SPLITTING?

A. No. In its *Line Sharing Order*, the Commission did not require ILECs to own and provide splitters to CLECs. Rather ownership is a discretionary right of the ILEC, not an obligation. This is consistent with the Act, which only imposes a duty on local exchange carriers to provide "for physical collocation of equipment necessary for . . . access to unbundled network elements at the premises of the

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14 *AT&T Petition* at 178.

15 *GTE Services Corp. v.* FCC, 205 F.3d 416 (D.C. Cir. 2000) ("*GTE Services Corp.*").

local exchange carrier." Likewise, nothing in the *Line Sharing Order* gives the CLEC the right to dictate ownership of a splitter.

Verizon VA has no obligation to assume the expense and risk of buying splitters (or any other equipment for that matter) in order to turn them over to CLECs for their use. Requiring Verizon VA to provide splitters for CLECs would place the burden of assuming the capital costs of buying, installing, and inventorying splitters upon Verizon VA and would pass on to Verizon VA the costs and risks should the CLECs decide at some future date not to continue to use the particular type of splitter that Verizon VA has stocked in inventory. This kind of obligation goes well beyond the Act's market-opening requirements for access to the ILEC's existing, functioning network. In addition, requiring Verizon VA to purchase and own such splitters to be used by an individual CLEC would be economically unsound, and administratively inefficient and cumbersome.

There would also be financial implications as CLECs migrate to newer, more technologically advanced splitter products and other means of providing advanced services, such as cable modems, which make up a large percentage of this market. As a result, Verizon VA would inevitably and unfairly be left with stranded splitter investment.

Q. DO DECISIONS FROM THE COMMISSION OR THE STATES SUPPORT YOUR STATEMENTS ABOVE ON THE ISSUE OF OWNERSHIP OF SPLITTERS IN LINE SHARING ARRANGEMENTS?

A. Yes. Commission decisions in California, Illinois, Pennsylvania, Massachusetts, Maryland, New York, North Carolina, and Washington all reached the same conclusions regarding ownership of the splitter. In California, the arbitrator concluded that "[w]hile a menu of choices may be optimal from the point of view of the CLECs, it is neither required by the Commission, nor is it reasonable." Final Arbitrator's Decision, at 21. The California, Illinois, Pennsylvania, Massachusetts, Maryland, New York, North Carolina, and Washington decisions found that the ILEC had no obligation to assume the financial and technology risks associated with owning splitters. The Commission, in approving SBC Communications' § 271 application, clearly stated that an ILEC does not have an obligation to make a splitter available in line sharing arrangements. Even if the Commission were to require that ILECs purchase and own splitters for use by CLECs, there would still have to be a "necessary and impair" standard test passed before splitters could be considered UNEs. That test could not be met because CLECs are perfectly capable of providing their own splitters, and are doing so today.

Q. DOES THIS SAME ANALYSIS APPLY TO SPLITTER OWNERSHIP IN A LINE SPLITTING SCENARIO?

A. Yes. The same two splitter options offered for line sharing arrangements are available to CLECs for line splitting: (i) a CLEC may purchase its choice of approved and NEBs (Network Equipment Building System Requirements) compliant splitters and may install the splitters with their collocation space or (ii)

a CLEC-purchased splitter may be installed in Verizon VA's central office space in a virtual collocation arrangement.

If Verizon VA were required to own splitters for line splitting or line sharing, equipment compatibility issues would be compounded because multiple CLECs may want to use the same Verizon VA splitter on a line-at-a-time basis and all splitters do not work with different CLEC DSLAMs. Thus, Verizon VA would likely have to buy and maintain a variety of splitters to match diverse CLEC equipment. Such a requirement is unreasonable, inefficient, and unnecessary. Although some CLECs claim that it is beneficial to have shared splitters (a claim which is unsubstantiated), and then tag Verizon VA with the ownership responsibility for those shared splitters, there is no valid reason that Verizon VA should have to buy the common equipment for everyone else to use. Verizon VA should not be placed in the position of having to purchase new equipment and bear the additional investment costs and risks for the CLECs, especially in this area of fast-changing technology.

In addition to the issues presented above, there would be additional and more complex administrative and operational problems associated with ILEC owned splitters in line splitting scenarios. Movement of customers from one voice CLEC to another and from one data LEC to another would be more complicated. Significant wiring and re-wiring problems could arise between the xDSL equipment and the MDF. This leg of the arrangement does not have dial tone or

electronic signatures that can ensure that the wiring is complete or wired accurately. Re-wiring between Verizon VA splitters and CLEC splitters would become commonplace.

In an ILEC-owned splitter configuration, hard wiring of the cable from the splitter to the DSLAM would not be possible. (Hard wiring reduces incomplete or inaccurate wiring issues.) The data leg would have to be wired a line at a time, which would create testing problems.

The ordering process including Cable Assignments would require new and different assignment processes than those in place today. Finally, because the splitter should be designed to match the CLEC DSLAM and be specified by the DLEC, the creation of unique inventories and types would undermine any effort for minimizing complexity. New splitter designs would also add to churn and inventory and assignment issues.

These issues, which are common to line sharing and line splitting, cancel out any possible value of an ILEC-owned splitter as a third splitter option – even if that option could be required, which it cannot. As a result, Verizon VA will offer line splitting utilizing either the CLEC purchased, physical collocation option or the CLEC purchased, virtual collocation option for splitter ownership and placement.

VI. CURRENT DLC AND NGDLC INCLUDED IN THE VIRGINIA NETWORK

(Issues III-10, IV-28, and V-6)

Q. WHAT IS THE CURRENT DLC ARCHITECTURE DEPLOYED BY VERIZON VA?

A. DLC technology was introduced in the early 1980s as a more efficient method of providing voice services to subscribers who were located at a relatively long distance from the serving central office. Voice services are considered narrowband and are limited to less than 4 kHz of bandwidth. Voice services can be efficiently sampled, converted to a digital signal, and aggregated with DLC electronics at a RT.

The planning and design basis of the DLC architecture was the establishment of geographic boundaries called "carrier serving areas" (CSA) around a central office. Each CSA contained a potential RT site where DLC equipment could serve subscribers within 9,000 to 12,000 ft. Verizon VA has deployed numerous types of DLC products in its network.

Q. CAN YOU EXPLAIN THE COMPONENTS OF DLC DESIGN?

A. Yes, referring to Exhibit ASP-7 and starting at the top right of the diagram, the copper distribution pair (also known as F2 pair) serving the end subscriber is cabled to a feeder distribution interface (FDI), which is a physical cross-connect point in the outside plant network. The FDI can also be known as the Serving Area Interface (SAI) or a Crossbox. The FDI may be near the RT or may be several thousand feet from the RT structure. The derived copper feeder pairs (shown as F1 pairs) connect the FDI to the DLC electronics located within the RT structure. The RT structure may be a cabinet, an aboveground hut or a buried

controlled environmental vault (CEV). The DLC electronics housed within this structure contain a series of line cards, which terminate one or more copper pairs serving the end users. The DLC electronics convert analog signals to digital signals and multiplexes individual subscriber traffic with other subscriber traffic onto a higher speed interface for transport to the central office. The DLC system may be fiber fed (meaning the DLC has either integrated optical transport cards or interfaces to a fiber multiplexer), or may be T1 copper fed. In the second case, the DLC system is served by one or more T1 copper facilities operating at 1.544 Mb/sec. At the central office, the narrowband traffic is routed to the central office switch via a universal or an integrated switch interface. In the case of a universal interface, the voice traffic is demultiplexed at the central office terminal (COT), converted back to analog, and routed to the voice switch via a cross-connect at the central office main distribution frame (MDF). In the case of an integrated switch interface, the voice traffic is demultiplexed (if required) and routed to a digital switch, typically at a DS1 level.

Q. WHAT IS THE PHYSICAL CABLING ARRANGEMENT BETWEEN THE REMOTE TERMINAL ELECTRONICS AND THE FEEDER DISTRIBUTION INTERFACE?

A. As shown in Exhibit ASP-8, the cable containing the derived copper feeder pairs extends from the FDI(s) to the remote terminal enclosure (RTE). This cable may contain several hundred to several thousand pairs, depending on the lines served by the RT and the FDI. Within the RTE, a splicing chamber is used to splice the outside plant cable to the cable extended from the protectors. The protectors serve

to isolate the RT electronics from lightning or other line power surges that may be introduced outside of the RT. The protectors are hardwired to the DLC electronics via connectorized cables (generally 100 pair). The connectorized cables terminate on the back plane[16] of the NGDLC electronics. RTs are pre-configured and pre-cabled prior to placement in the field due to the complexity of installing new equipment shelves, wiring and cabling once the RT is deployed.

Q. DOES THE RT PROVIDE A CROSS-CONNECT POINT LIKE A MAIN DISTRIBUTION FRAME IN A CENTRAL OFFICE?

A. No, the DLC electronics are essentially hardwired through the protectors and the splice point to the associated FDI(s) location. Hardwiring between two points in the network effectively eliminates access to individual physical pairs because the cables are connectorized (*i.e.* the cable is pre-wired with a connector and individual wires are not accessible) and bundled between the two termination points, with no intermediate access point. The RT configuration does not offer a cross-connect point like a MDF in a central office for accessing individual pairs. In addition, existing Operations Support Systems do not allow assignment of individual pairs except at the FDI.

Q. WHERE IS THE ACCESSIBLE POINT FOR THE DISTRIBUTION CABLE PAIRS?

A. In our existing loop design, the accessible point for the distribution cable pairs is at the FDI. This is the point in the outside plant network where distribution pairs

[16] The back plane is the shared circuiting of the NGDLC system connecting line card slots to other common hardware, and houses the physical cabling connections.

associated with subscribers can be physically cross-connected to copper feeder pairs extended from the remote terminal. Because the network is generally designed with a higher distribution pair count than feeder pair count, the FDI also serves as a tapering point for the copper pair network. However, once a subscriber is assigned to a DLC system, there is a one-to-one association between the copper feeder pair and the distribution pair.

Q. IS THERE A REASON WHY THE RT IS NOT EQUIPPED WITH A CROSS CONNECTION POINT?

A. Yes, an additional cross connect point at the RT would simply add additional costs and reduced network reliability and would not introduce any offsetting benefits toward the provision of service to Verizon VA's subscribers.

Q. WHAT IS "NEXT GENERATION DIGITAL LOOP CARRIER" (NGDLC)?

A. The adjective "Next Generation" DLC has been used by vendors since the 1980s to describe various improvements in DLC technology. This often-misused label has generally applied to the currently used digital loop carrier called Litespan, manufactured by Alcatel. The label "Next Generation" was first applied to this Litespan product almost ten years ago. Like computers labeled with "high speed" 386-25 MHz processors ten years ago, the use of the adjective "Next Generation" does not always reflect that our embedded base of NGDLC may not include all of tomorrow's desired functionality.

Q. PLEASE EXPLAIN THE NGDLC ARCHITECTURE THAT IS DEPLOYED IN VIRGINIA.

A. Litespan NGDLC systems became available in the late 1980s as an evolution from the older 96/192 line DLC systems. NGDLC relies on the same carrier serving area design concept as DLC, but are optimized for much higher number of subscribers at a RT by taking advantage of the larger scale circuit integration technology which became available at that time. NGDLC products are designed to be scalable and may serve as many as 2000 lines when fully configured. NGDLC products typically allow allocation of individual channel banks within the same system for either universal or integrated switch interfaces.

Q. DOES THE VIRGINIA NETWORK INCLUDE BOTH DLC AND NGDLC EQUIPMENT DESIGNS?

A. Yes, the Virginia network has evolved, like most telecommunications networks, with an ongoing introduction of different access technologies. These include first generation DLC systems that were deployed to serve 96-192 lines, and second generation DLC systems that are optimized for larger subscriber counts. In the early 1980s, the initial deployment of "pair gain" devices in Virginia consisted of first generation DLC systems supporting 96 lines. Subsequently, second generation DLC systems serving 192-672 lines were deployed in the late 1980s and early 1990s. Beginning in the mid 1990s, Lightspan NGDLC systems were deployed in Virginia to support narrowband growth requirements. At the present time, it is estimated that approximately 14.8% of the lines in Virginia are provisioned on Lightspan NGDLC equipment. Eighteen percent are installed on the first and second generation DLC.

VII. FUTURE NGDLC AND INTEGRATED ADSL

(Issues III-10, IV-28, and V-6)

Q. WHAT IS ASYNCHRONOUS DIGITAL SUBSCRIBER LINE (ADSL)?

A. ADSL is a technology that allows high-speed data services contained in the high frequencies above the 0-4000 HZ voice band spectrum to be transmitted simultaneously with the voice signal on a copper pair.

Q. DO THE VOICE TRAFFIC AND THE DATA TRAFFIC THAT SHARE THE COPPER PAIR USE SIMILAR TECHNICAL ARCHITECTURES AND TRANSPORT DESIGNS?

A. No. While they share the same copper pair, the voice and data traffic use different transport technologies. Each customer's analog voice signal is sampled at the DLC and coded into a digital bit stream that is aggregated with other customers' digitized voice signals using a Time Division Multiplexing (TDM) scheme. These TDM signals are transported and switched via a TDM compatible network architecture. This arrangement supports constant throughput for each voice channel. By contrast, each customer's digital data that is contained in high frequency ADSL signal is reconstructed at the DSLAM and assembled into Asynchronous Transfer Mode (ATM) cells. These ATM cells are aggregated with other customer's data cells and transported and switched via an ATM compatible network architecture. This arrangement supports throughput that may vary for each customer based on the amount of data the customer transmits.

Q. HOW CAN ADSL CAPABILITY BE INTEGRATED WITH NGDLC SYSTEMS?

A. Starting in the late 1990s, some NGDLC vendors began to develop integrated line cards that could perform the dual functions described above. These line cards also contain splitter devices that split the voice and data traffic and route each to the appropriate portion of the transport path, ATM vs. TDM, to the central office. Along with the line cards, vendors began to develop the necessary software upgrades to support these new cards and enable ADSL functionality as part of the NGDLC system. In some cases, new processor hardware had to be developed to support the new ADSL architecture. The use of these higher power line cards also required, in most cases, upgraded power wiring arrangements within the NGDLC system. Because narrowband services were transported over a TDM path back to the central office, vendors had to develop transport capabilities that could support transmission of ATM traffic associated with the ADSL high-speed data services. Finally, NGDLC vendors and OSS vendors had to undertake design of new OSSs, including Element Manager Systems that could manage and control the assignment, provisioning, surveillance, and maintenance of the high-speed data portion of their systems.

Q. IS VERIZON VA'S ABILITY TO INTEGRATE ADSL CAPABILITIES WITH NGDLC SYSTEMS DEPENDENT ON THE ACTIONS OF VENDORS?

A. Yes. NGDLC vendors who have developed or are developing integrated ADSL capabilities have pursued solutions that are highly dependent on their individual NGDLC architecture and design. This includes different ADSL line card counts (two, four, six lines per card), different means of transporting high-speed data

traffic to the central office (in addition to their existing narrowband transport design), and different software/hardware upgrade strategies. Also, because integrated ADSL line cards require higher power, some vendor implementations of ADSL lead to partitioning of channel banks for integrated ADSL vs. POTS only use.

Q. CAN INTEGRATION OF ADSL IMPACT EXISTING NGDLC POTS CAPACITY?

A. Yes. NGDLC line cards generally terminate four POTS lines per card. In some cases, NGDLC vendors introduced integrated voice/data line cards that terminated fewer lines per card, such as "dual" integrated line cards. Therefore, in those cases, for every line card placed in the system, the overall POTS capacity of the system is correspondingly reduced by a multiple of at least two.

Q. WHAT STEPS ARE REQUIRED TO INTEGRATE ADSL FUNCTIONALITY WITH NGDLC SYSTEMS?

A. First, the enclosure must be suitably sized and powered. Next, integrated line cards must be placed in the NGDLC channel bank shelves, and the NGDLC system must be equipped with the necessary software and hardware upgrades to support ADSL. This generally requires that a new version of software be loaded and may require the addition of new processor cards and/or other common cards required for ADSL functionality. Because the high-speed data requires additional transport capacity in the NGDLC system, ATM transport cards must be placed to support the data traffic. This may require assignment of additional fibers (if available) or transport capacity as part of a higher speed transport facility. At the

central office, an Optical Concentration Device (OCD) must be placed to provide aggregation of data traffic and routing of individual subscriber traffic to a data carrier. Finally, OSS must be capable of supporting the assignment, inventory, provisioning, surveillance, and maintenance of ADSL functionality at the RT.

Q. IN VIRGINIA, WHAT APPROACH(S) HAVE VERIZON'S NGDLC VENDORS USED FOR TRANSPORTING HIGH-SPEED DATA FROM THE REMOTE TERMINAL TO THE CENTRAL OFFICE?

A. Verizon VA's current NGDLC vendor, Alcatel, has designed its product with a separate voice and data transport architecture back to the central office. This means that voice and data traffic are carried over separate high-speed optical signals back to the central office.

Q. CAN YOU EXPLAIN THE "NGDLC WITH SEPARATE VOICE AND DATA TRANSPORT" ARCHITECTURE?

A. Yes, referring to Exhibit ASP-9, the voice and data traffic is split at the integrated line card. The voice traffic is routed to the narrowband portion of the system and transported to the central office using a time division multiplexed configuration. TDM is the traditional technology utilized by DLC systems for transport of narrowband services to the central office. In the diagram, the voice traffic is carried over the OC-3 voice portion of the system. Alternatively, the data traffic, which is formatted as ATM cells, is routed from the line card, through an ATM switching fabric, to the high-speed ATM transport portion of the system. This is referenced in the diagram as the OC-3c ATM data transport facility. At the central office, the voice traffic terminates on a COT and is routed to Verizon's

voice switch or to another carrier's collocation arrangement. The data traffic is routed to an OCD, which is an ATM switching device. The OCD performs a routing and aggregation function by terminating data traffic from one or more RTs and directing the traffic to the appropriate data carrier.

Q. HAS VERIZON DEPLOYED THE LITESPAN NGDLC ARCHITECTURE DESCRIBED ABOVE?

A. No.

Q. WILL NEW NGDLC THAT IS DEPLOYED IN VIRGINIA HAVE THE DUAL FUNCTIONALITY DESCRIBED ABOVE?

A. Not at this time. As POTS growth triggers feeder relief that will require the installation of new DLC, Verizon VA will purchase and design new NGDLC systems that are capable of supporting only POTS services. The new installations, however, will be built with space that would allow upgrading the remote terminal components, as part of a ATM packet network, if Verizon VA decides to make that investment in the future. Verizon VA has not installed these NGDLC systems with the electronics that support the ATM packet functionality, now has it installed any OCDs or packet switches with which these systems would communicate.

Q. FOR EXISTING NGDLC SYSTEMS DEPLOYED IN THE VIRGINIA NETWORK, ARE THERE ADDITIONAL ADSL INTEGRATION ISSUES TO BE CONSIDERED?

A. Yes, the Virginia network currently has numerous types of DLC systems deployed. Of this list, only a small number of DLC product types are considered to be potentially upgradeable to support ADSL. Of this number of potentially upgradeable systems, a site-by-site review of remote terminal locations must be conducted to assure that proper system capacity; fiber capacity, power, heating, and ventilation requirements can be met. In the case of the Alcatel LitespanÒ 2000 system, Verizon has determined that integration of ADSL capability can only be reasonably accomplished through the dedication of a separate channel bank shelf for integrated line cards. In addition, spare fiber and transport capacity may not exist at all RT locations. Because integrated line cards have higher power requirements, upgrades to existing power wiring at the RT may also be required. If the RT structure is not equipped with sufficient heat exchanger apparatus, the RT cannot support the higher heat dissipation requirements associated with ADSL line cards. Even assuming that these requirements can be met at a specific RT location, the resulting "cost to upgrade" must be assessed on a RT-by-RT basis.

VIII. VERIZON VA'S PROPOSAL FOR PROVIDING ACCESS TO HFPL FOR FIBER FED LOOPS

(Issues III-10, IV-28, and V-6)

Q. HAVE AT&T AND WORLDCOM PROPOSED INTERCONNECTION AGREEMENT PROVISIONS THAT REQUIRE VERIZON VA TO PROVIDE INTEGRATED DSLAM FUNCTIONALITY AT THE RT AND DSL TRANSPORT OVER FIBER FEEDER (I.E., "DSL OVER FIBER")?

A. Yes. Despite the fact that neither this capability nor the necessary OSS currently exist in Verizon VA's network, both AT&T and WorldCom have proposed extensive terms and conditions addressing this issue. As discussed below, their language goes beyond the requirements of the Act and the Commission and ignores the necessity to evaluate all technical and operational issues surrounding their proposals.

Q. PLEASE SUMMARIZE VERIZON VA'S CONCERNS ABOUT INCLUDING SUCH PROVISIONS IN ITS INTERCONNECTION AGREEMENTS WITH AT&T AND WORLDCOM?

A. First, the numerous operational and technical issues associated with providing access to the HFPL for fiber fed RTs are under active investigation by the Commission in a Further Notice of Proposed Rulemaking (FNPR).[17] AT&T and MCI's request for integrated DSLAM functionality at the RT and DSL transport over fiber feeder (*i.e.*, "DSL over fiber") represents just one possible solution under discussion in that proceeding. The FNPR should therefore be completed before this issue is decided in this proceeding or in any state-specific arbitration. This approach would allow the most efficient use of the parties' resources. An arbitration in one state jurisdiction among a very limited set of the total number of interested parties is not the appropriate venue for resolving these issues that affect all jurisdictions and many additional parties.

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[17] *See Deployment of Wireline Services Offering Advanced Telecommunications Capability and Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, Third Report and Order on Reconsideration in CC Docket No. 98-147, Fourth Report and Order on Reconsideration in CC Docket 96-98, FCC 01-26, Third Further Notice of Proposed Rulemaking in CC Docket No. 98-147, and Sixth Further Notice of Proposed Rulemaking in CC Docket No. 96-98. (Released January 19, 2001) (*Line Sharing Reconsideration Order).*